Island Lake

Sullivan County

2007 Supplemental Survey

Date of Survey: September 27, 2007

Biologist: David S. Kittaka

Assistant biologist: Debbie King/Michelle Weinman

Survey Objective: To document the survival and growth of the 4,800 smallmouth bass stocked in 2003 and 6,268 stocked in 2006 at Island Lake located at Minnehaha Fish and Wildlife Area, while testing the effectiveness of the 5.0 GPP electrofishing system in high conductivity waters. Information on fish population structure was also documented under the General Management of Fisheries work plan #D38603.

Methods: The Secchi disk reading, pH, dissolved oxygen, and conductivity were collected. One hour of night electrofishing was conducted using District 7's 5.0 GPP pulsed DC electrofishing system at 16 to 18 amps, at 50% power.

Summary:

On September 27, 2007 the clarity of Island Lake was exceptional with a Secchi disk reading of 22.0 ft. Dissolved oxygen was adequate for fish survival to 28 ft. The depth at the sample site was 66 ft. The surface temperature was 77.2°F and the pH was 8.2. The conductivity was 2,490 μS. Aquatic vegetation was sparse. In shallower areas of the pit, single stalks of a potamogeton (American or Illinois) was observed sporadically in 2 to 5 ft of water. Smallmouth and largemouth bass were observed swimming vertical to the steep rock walls and taking cover under ledges. One common carp was observed.

A total of 98 fish were collected during one hour of electrofishing with the 5.0 GPP electrofishing system compared to 97 fish collected with the standard electrofishing system (Type VI-A) in 1998 under similar conditions (Schoenung 1999). Fish were observed swimming within 3 ft of sampling gear unaffected by the field. When fish came within approximately 2 ft of the droppers, tetany was immediate.

Twenty-nine largemouth bass were collected ranging from 4.5 to 14.1 in TL. Bass represented nearly 30% of the fish collected. Growth was within the range expected for District 6 pits. Other fish collected included 23 redear sunfish, 20 longear sunfish, 18 bluegill, and 4 warmouth. Four age-1 smallmouth bass were collected. They ranged from 6.4 to 8.3 in TL. No smallmouth bass from the 2003 stocking were collected.

Rainbow trout are stocked annually at Island Lake. No trout were collected during this survey. Historically, trout were only collected in gill nets.

Collecting fish has been marginally effective with standard VIA-type electrofishing units at Island Lake. The Smith Root® 5.0 GPP is rated for use in higher conductivity waters. However, limitations still exist with the extreme conditions at Island Lake. Smith Root recommends modifying the standard set up to increase the size of the electric field (Crump 2008). Increasing the electric field can be accomplished to varying degrees by any one, or combination of the following: increasing the diameter of the electrodes, increasing the diameter of the array, moving the array (anode) further from the boat (cathode), and/or using a drop-line cathode. The resulting larger electric field will also lower the intensity of the electric current within the field thereby reducing the load on the generator.

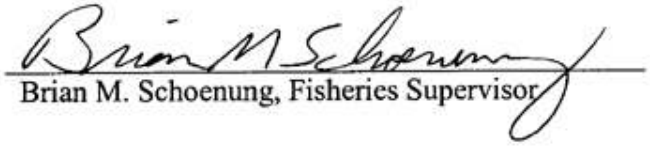
Smallmouth bass are no longer being cultured by Indiana's hatchery system. Based on this lack of availability, the smallmouth bass stocking program at Island Lake is being discontinued.

Literature Cited:

Crump, R. 2008. Production Engineer, Smith Root, Inc. Personal communication.

Schoenung, B.M. 1999. Island Lake Minnehaha Fish and Wildlife Area, 1998 Fish Management Report. Indiana Department of Natural Resources, Indianapolis, Indiana.

Submitted by: Debbie A. King, Assistant Fisheries Biologist
Date: February 1, 2008
Approved by: David S. Kittaka, Fisheries Biologist

Approved by: 
Brian M. Schoenung, Fisheries Supervisor

Date: April 25, 2008

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [X] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Island Lake	Sullivan	9/27/2007
Biologist's name		**Date of approval (Month, day, year)**
Dave Kittaka, Debbie King, Michelle Wienman		4/25/2008

LOCATION

Quadrangle Name	Range	Section
Dugger	9W	1, 36
Township Name	**Nearest Town**	
7N, 8N	Sullivan	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
Concrete boat ramp		

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
48	86	Unkn	Unkn	Unkn	1 - 3 feet

Location of benchmark

INLETS

Name	Location	Origin
Unnamed creek	North	Teal Pond
Canvasback Pit (ground water)	Northeast	

OUTLETS

Name	Location
Unnamed creek	West northwest

Water level control

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM		
TOP OF FLOOD CONTROL POOL		
TOP OF CONSERVATION POOL		
TOP OF MINIMUM POOL		
STREAMBED		

Bottom type

- [X] Boulder
- [ ] Gravel
- [X] Sand
- [ ] Muck
- [X] Clay
- [ ] Marl

Watershed use

Fish and Wildlife Area, pasture land.

Development of shoreline

Concrete boat ramp and gravel parking area on west side.

Previous surveys and investigations

6,268 Smallmouth bass stocked in 2006

Fisheries Survey 1986, and 1998. Water sampling 1987. Voluntary Creel 1988.

SAMPLING EFFORT AT ISLAND LAKE, 2007					
ELECTROFISHING	Day hours: N/A		Night hours: 1		Total hours: 1
TRAP NETS	Number of traps		Number of Lifts		Total effort
GILL NETS	Number of nets		Number of Lifts		Total effort
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS	
Color: Clear	Turbidity: 22 Feet 0 Inches (SECCHI DISK)
Alkalinity (ppm)* Surface: Bottom:	pH Surface: 8.2 Bottom:
Conductivity: 2,490 □S	Air temperature: °F
Water chemistry GPS coordinates: N W	

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)								
DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	77.2	4.90	36	52.0	3.46	72		
2	77.0	5.02	38			74		
4	77.0	4.80	40	50.7	3.00	76		
6			42			78		
8	76.6	4.92	44	49.6	3.59	80		
10			46			82		
12	75.9	4.81	48	48.6	0.94	84		
14			50			86		
16	75.6	4.85	52	48.2	0.87	88		
18			54			90		
20	73.9	4.88	56	48.0	0.81	92		
22			58			94		
24	67.5	6.11	60	47.8	0.78	96		
26			62			98		
28	58.6	5.12	64	47.8	0.75	100		
30			66 btm	47.7	0.71			
32	54.3	4.17	68					
34			70					

COMMENTS
Used District 7's 5.0 GPP low voltage system: 16 to 18 Amps, Pulse 60DC, 50% power.

*ppm-parts per million

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT AT ISLAND LAKE, 2007					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Largemouth bass	29	29.6	4.5 - 14.1	not taken	
Redear sunfish	23	23.5	4.1 - 7.9		
Longear sunfish	20	20.4	2.7 - 5.7		
Bluegill	18	18.4	1.9 - 8.0		
Smallmouth bass	4	4.1	6.4 - 8.3		
Warmouth	4	4.1	3.2 - 5.7		
Observed one common carp from shore					
TOTAL	98	100.0			

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS AT ISLAND LAKE, 2007									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0					22.0				
4.5	2	6.9	**	yoy	22.5				
5.0	1	3.4		yoy	23.0				
5.5	2	6.9		1	23.5				
6.0	2	6.9		1	24.0				
6.5	1	3.4		1	24.5				
7.0	2	6.9		1	25.0				
7.5	2	6.9		1	25.5				
8.0					26.0				
8.5	3	10.3		1	TOTAL	29			
9.0	5	17.2		1,2					
9.5	2	6.9		1					
10.0									
10.5	3	10.3		3					
11.0	1	3.4		2					
11.5	1	3.4		3					
12.0									
12.5									
13.0									
13.5	1	3.4		3					
14.0	1	3.4		3					
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	29.0/hr	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

** Not taken.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL AT ISLAND LAKE, 2007									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	1	5.6	**	yoy	19.5				
2.0	2	11.1		1	20.0				
2.5	4	22.2		1	20.5				
3.0	2	11.1		1	21.0				
3.5	2	11.1		1	21.5				
4.0	1	5.6		2	22.0				
4.5	1	5.6		2	22.5				
5.0					23.0				
5.5					23.5				
6.0					24.0				
6.5	1	5.6		4	24.5				
7.0					25.0				
7.5	2	11.1		5	25.5				
8.0	2	11.1		5	26.0				
8.5					TOTAL	18			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	18.0/hr	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

** Not taken.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH AT ISLAND LAKE, 2007									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0	1	4.3	**	1	22.0				
4.5					22.5				
5.0	3	13.0		2	23.0				
5.5	2	8.7		2	23.5				
6.0	4	17.4		3	24.0				
6.5	1	4.3		3	24.5				
7.0	11	47.8		3	25.0				
7.5	1	4.3		3	25.5				
8.0					26.0				
8.5					TOTAL	23			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	23.0/hr	GILL NET CATCH	N/A	TRAP NET CATCH	N/A

** Not taken.

Lake: Island Lake
Date: 9/27/2007
Species: Largemouth bass

Length group (in)	Total # number	Sub-sample	Age 1	2	3	4	5	6
1.0								
1.5								
2.0								
2.5								
3.0								
3.5								
4.0								
4.5	2							
5.0	1							
5.5	2	1	2					
6.0	2	2	2					
6.5	1	1	1					
7.0	2	2	2					
7.5	2	2	2					
8.0								
8.5	3	3	3					
9.0	5	5	2	3				
9.5	2	2	2					
10.0								
10.5	3	2			3			
11.0	1	1		1				
11.5	1	2			1			
12.0								
12.5								
13.0								
13.5	1	1			1			
14.0	1	1			1			
14.5								
15.0								
Total	29	25	16	4	6			

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	0	0.0	0.00	0.00	0.0	0.0
2	0	0.0	0.00	0.00	0.0	0.0
3	0	0.0	0.00	0.00	0.0	0.0

Lake: Island Pit
Date: 9/27/2007
Species: Redear sunfish

Length group (in)	Total # number	Sub-sample	Age 1	2	3	4	5	6
1.0								
1.5								
2.0								
2.5								
3.0								
3.5								
4.0	1	1	1					
4.5								
5.0	3	3		3				
5.5	2	2		2				
6.0	4	4			4			
6.5	1	1			1			
7.0	11	11			11			
7.5	1	1			1			
8.0								
8.5								
9.0								
Total	23	23	1	5	17			

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	1	4.3	0.00	0.00	0.0	0.0
2	5	5.5	0.08	0.12	5.2	5.7
3	17	7.0	0.22	0.11	6.8	7.2

Lake: Island Pit
Date: 9/27/2007
Species: Bluegill

Length	Total #	Sub-	Age					
group (in)	number	sample	1	2	3	4	5	6
1.0								
1.5	1							
2.0	2	2	2					
2.5	4	2	4					
3.0	2	2	2					
3.5	2	1	2					
4.0	1	1		1				
4.5	1	1		1				
5.0								
5.5								
6.0								
6.5	1	1				1		
7.0								
7.5	2	2					2	
8.0	2	2					2	
8.5								
Total	18	14	10	2		1	4	

Age	Number	Mean TL	Var	SE	Lo 95%CI	Up 95%CI
1	10	3.0	0.29	0.17	2.61	3.29
2	2	4.5	0.13	0.25	4.00	5.00
3						
4	1	6.8	0.00	0.00	0.00	0.00
5	4	8.0	0.08	0.14	7.71	8.29